



Consolidated Operational Activities List (COAL) Taxonomy Proposal

J7 JCS
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J7 & J8 JCS Challenges (Aldridge Study Findings)

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Force Employer

Mission

Effects

Operational Capabilities (Ways measured by MOEs)

Functional Capabilities (Means measured by MOPs)

Tasks/Activities

Area of Weakness

Area of Strength

Current UJTL and
Architecture
"Center of Gravity"

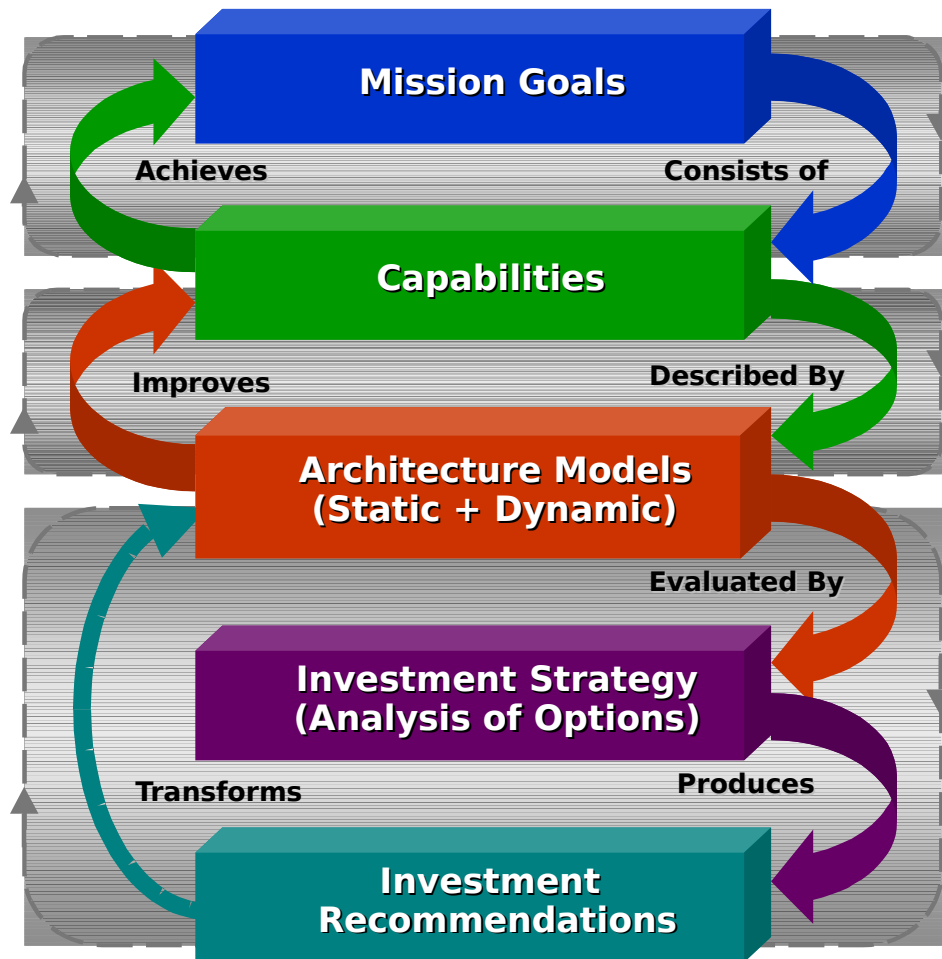
Force Builder



Why Architectures?

Mission Goals

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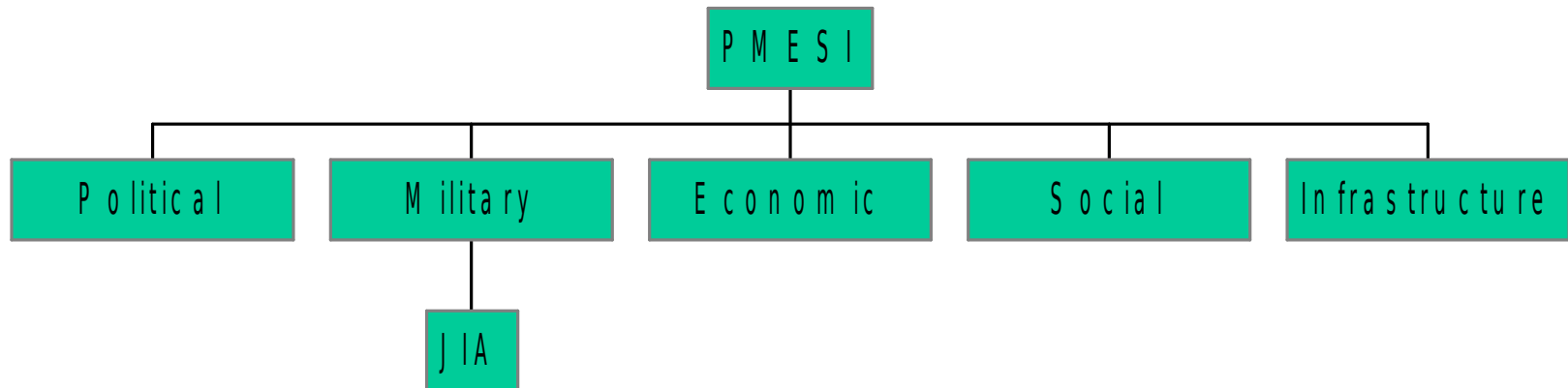
Key Issues:

- 1) DODAF and JCIDS tell you “what” to do, but not “how” to do it
- 2) And DODAF hasn’t evolved enough to effectively support operations, capabilities and rigorous quantitative analyses



Means

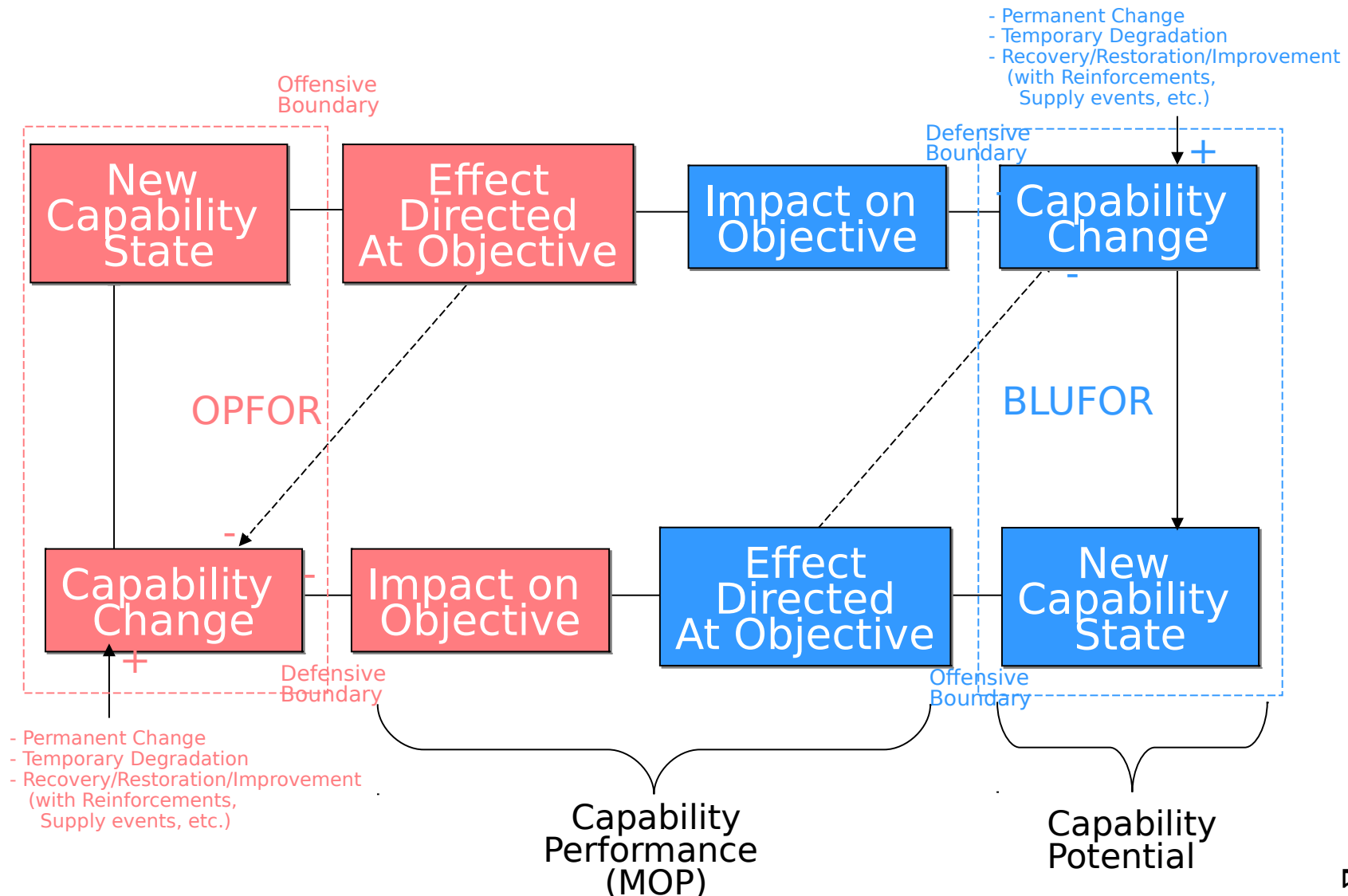
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Capability-Effects-Impacts Cycle

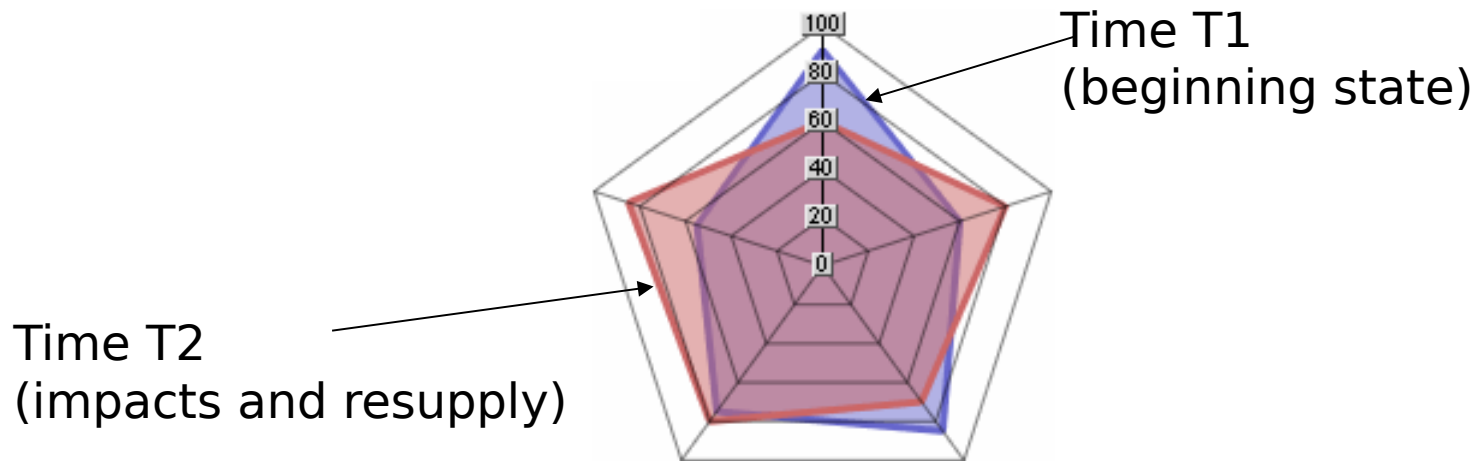
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Capabilities/Potential – when applied, have a multi-dimensional and temporal nature

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Parallel Efforts (Need to be Converged)

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- Aldridge Study: Comprehensive Capability Categories List – “effects menu” (JS J-8, March 04 initiation)
- UJTL Revision: Interactive, web-based, updated data, capabilities emphasis – “UJCL?” (JS J-7, March 04 initiation)
- Joint Integrated Architecture: Functional tasks, attributes, metrics (JS J-8 ongoing)
- Common Operational Activities Library (operational architecture) (JFCOM J8/9 CSAWG / Army, just begun)
- Common Systems Functions List: Functional architecture (JFCOM J8/9 CSAWG / Navy, ongoing)



Alignment with Aldridge Study

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operational

functional

Tasks/A ctivities

O

D

A

E ffects/C apabilities

O

D

A

FC.BA

FC.C2

OC.DSA

OC.EFN

OC.DAS

FC.FA

FC.FP

FC.FL

FC.NC

M issions

O

D

A

JOC.MCO

JOC.SD

JOC.SO

JOC.HLS

COAL

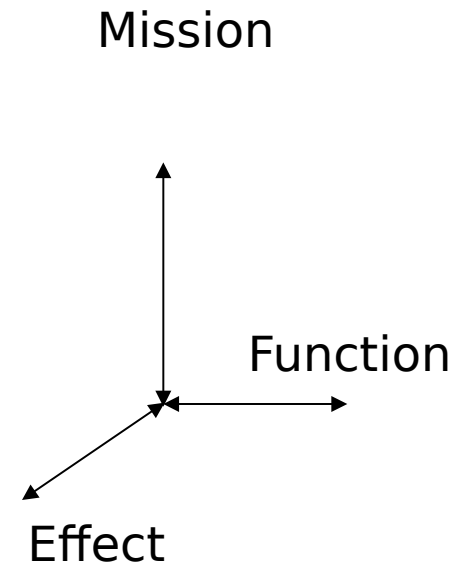
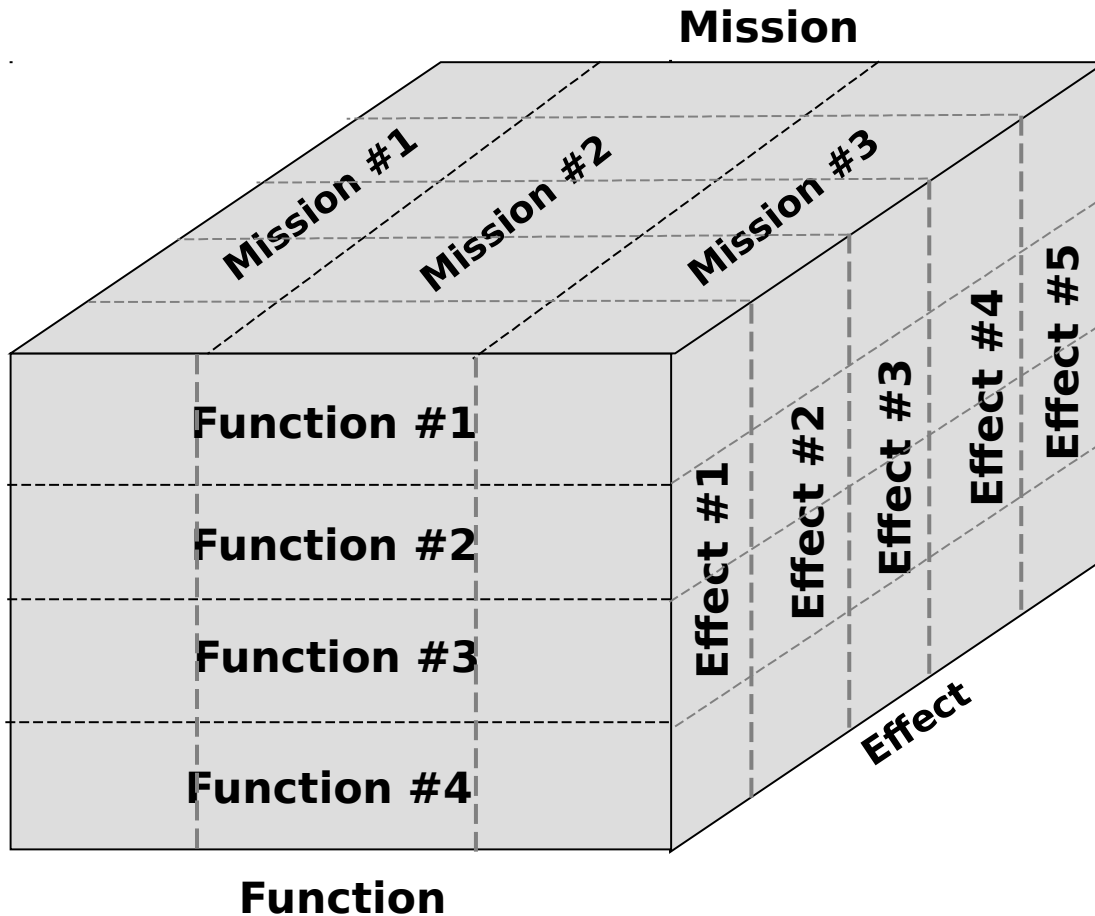
Strategy - D
Planning - A
Resourcing - A
Executing - A

JOC - Joint Operating Concept
OC - Operational Capability
FC - Functional Capability
DSA - denying sanctuary to the adversary
EFN - ensuring freedom of navigation
DAS - denying adversary access to space



Mission, Effect, Function Perspectives

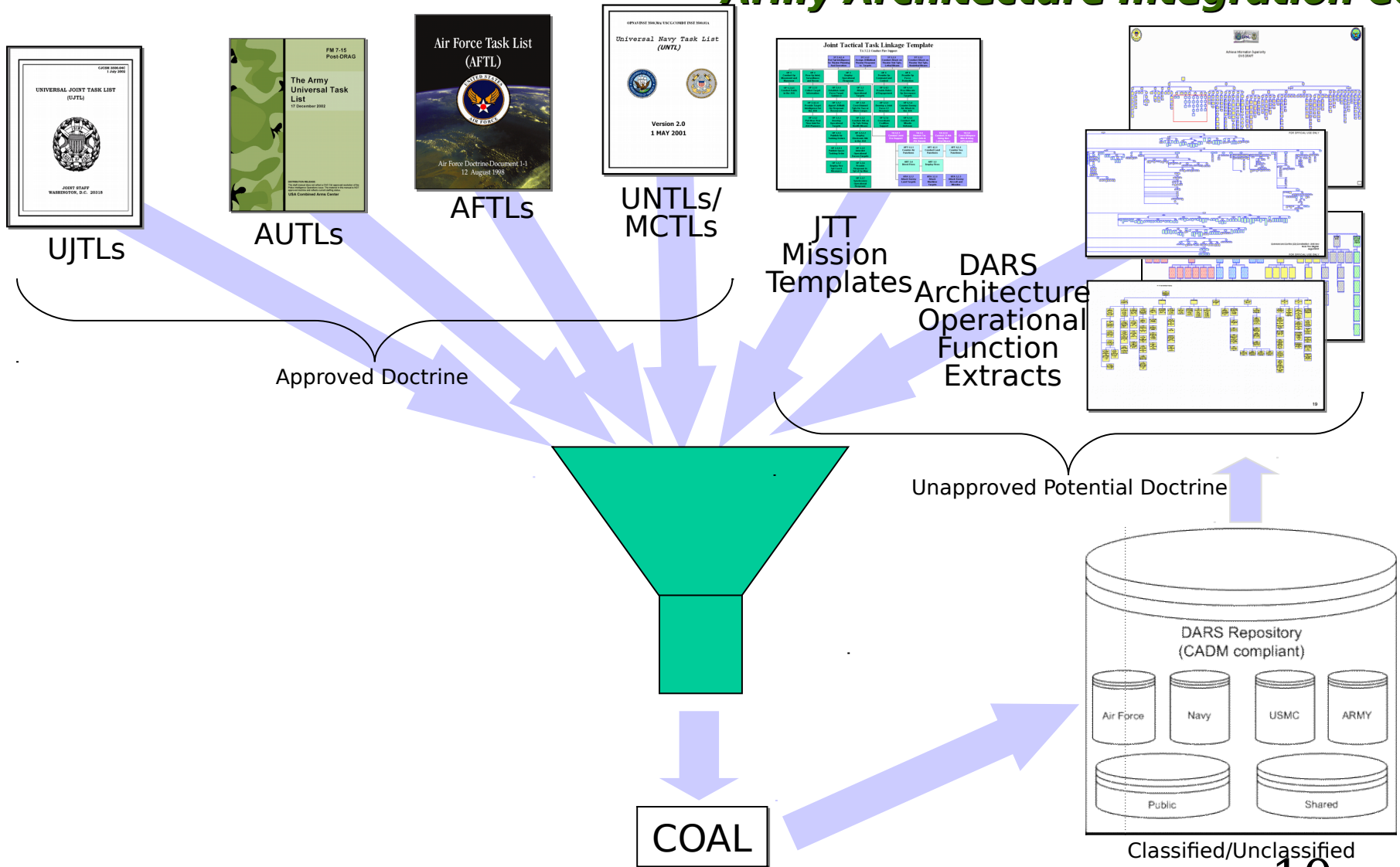
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COAL Top Level View (Ingredients)

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Proposed COAL Taxonomy Requirements

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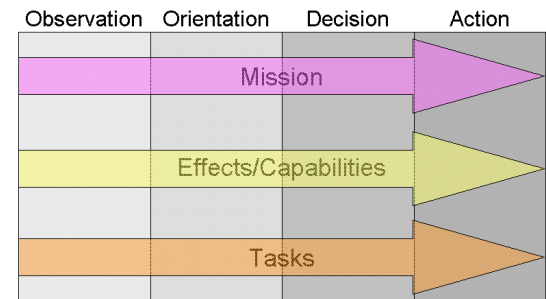
- Simple, intuitive, understandable and standard terminology
- Support hierarchical levels of task aggregation
 - not just component tasks
- Support COCOM perspective (JTF HQ centric)
- Support DODAF architecture reuse
- Facilitate intelligent browsing
- Support rapid prototyping
- Facilitate automated adaptive intelligent attribute linking / meta data tagging
- Facilitate foundation for “best practices”
- Facilitate / support migration to OO



Proposed COAL Classification Structure

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- Horizontal Classification
 - Net Centric Warfare OODA model
 - Observation – Input Info, snapshot (sensory)
 - Orientation – Situation Knowledge (cognitive)
 - Decision – (cognitive)
 - Action – Output (kinesthetic)
 - The way Humans and Support Systems perform functions
 - Recommend OODA model for both COAL and CSFL
- Vertical Hierarchy (football metaphor)
 - Missions (game)
 - Effects/Capabilities (plays)
 - Tasks (tasks)





UJTL Noun Phrases binned into OODA categories

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- Observation
 - Reports on situation, impacts, asset status/count, capabilities, readiness, resources, obtain/collect/acquire Intel, etc.
- Orientation
 - Assessment, review, evaluation, interpretation, estimation, validation, prioritization, correlation, comparison, determination
- Decision
 - Selection, COA development, authorization, approval, assignment
- Action
 - Execution of COA, alert, organization, preparation, train, deployment, attack, supply, communication, protection, maneuver / counter-maneuver, securing, resolution, isolation, suppression, launch



Recommended Road Ahead

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Consolidated List
Verb Model
Normalization focus

Common Library
Object Model
Simplification focus



COAL “Ingredients” Semantic Observations

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- Total approximate task count
 - UJTL’s + AFTL’s + AUTL’s +
UNTL’s/MCTL’s
 - Total approximately = 1700
- Too many different joint and cross service architecture building blocks
 - need a reduction/simplification scheme



Classification Structure Content Semantic Observations

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- Initial UJTL task verb and noun phrase analysis
 - 800+ UJTL tasks
 - 133 unique verbs (averaging 6 verbs for each noun phase)
- Object Model facilitates simplification
 - Object model focus is on “topic” (task noun phrase)
 - Verbs are related to function performed on the topic (object)
 - Approximate unique “topics” = $1/6^{\text{th}}$ = 300
 - Additional reduction due to object attributes approx 33%
 - = 200 base class “topics” (uninstantiated)
 - JTT Mission Templates, MCP's, Architecture Process Segments, Capabilities, Mission objects are all additive (albeit small numbers – e.g 30 JTT's)



Object Graphic Structure Recommendation

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ObjectName
ObjectAttributes
ObjectFunctions

topic	CourseOfAction
topic attributes	CourseOfAction.LevelOfWar CourseOfAction.ConditionsList CourseOfAction.MOPList CourseOfAction.DOTMLPFLinks CourseOfAction.RelatedInfoLinks etc., etc.
action performed on topic	Develop() Communicate() Review() Update()



Example from UJTL Distillation Process

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Support
-Space -Navigation -WeatherEnvironmental -SurveillanceReconnaissance -DefensewideBaseOperations -Legal -HostNation -Personnel -PersonnelManagementAndMorale -DefensewideReligious -ForUnifiedJointAndMultiNationalOperations -Decision -BaseAndOperationsForUnitsAndIndividuals -Logistic
+Provide() +Coordinate() +Acquire() +ProvideFor() +ReceiveAndProvide() +Expand()



Current (Verb) vs Object (Topic) Perspectives

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Shoot

Target

Current dominant perspective

Target

Shoot

Object Model (Topic) perspective



Object Text Syntactical Recommendation

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- Format:
 - C++ Namespace scoping example
 - Namespace.Class.Method
 - E.g. - System.IO.FileStream.Open()
 - Read right-to-left
 - Major_OpFunc.Sub_OpFunc.Action
 - Observation.NationalIntel.Collect()
 - Read right-to-left
 - Collect (function) NationalIntel (sub-class) as part of Observation class
 - Decision.TargetList.Prioritize()
 - Action.Forces.Deploy()
 - Supports/facilitates executable architectures
 - Examples above are C++ code templates
 - Code template logic code would come from OV-6's